

22. (New) The optical imaging system of claim 20, wherein an image height on the surface is at least 10 mm.

23. (New) The optical imaging system of claim 20, further comprising a reflective surface arranged to direct a light flux from the catadioptric optical system to the refractive optical system.

24. (New) The optical imaging system of claim 20, wherein the refractive optical system includes an aperture stop.

25. (New) The optical imaging system of claim 20, wherein the aspheric optical surface is a refractive optical surface.

26. (New) The optical imaging system of claim 20, wherein the aspheric optical surface is a reflective optical surface.

27. (New) An exposure apparatus comprising:
a reticle;
an ultraviolet excimer laser situated to illuminate the reticle;
a substrate; and
the optical imaging system of claim 20, situated and configured to form an image of the reticle on the substrate.

28. (New) An imaging system for forming an image of an object on a surface, the imaging system comprising:

(a) a catadioptric optical system that forms an intermediate image of the object, the catadioptric imaging system including:

- (i) a concave mirror, and
- (ii) at least one diverging lens arranged such that a light flux from the object propagates through the diverging lens to the concave mirror and is reflected by the concave mirror to the diverging lens; and

(b) a refractive optical system that forms an image of the intermediate image on the surface, wherein at least one of the catadioptric optical system and the refractive optical system includes an aspheric optical surface.

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29. (New) The optical imaging system of claim 28, wherein an image-side numerical aperture is at least 0.6.

30. (New) The optical imaging system of claim 28, wherein an image height on the substrate is at least 10 mm.

31. (New) The optical imaging system of claim 28, further comprising a reflective surface arranged to direct a light flux from the catadioptric optical system to the refractive optical system.

32. (New) The optical imaging system of claim 28, wherein the refractive optical system includes an aperture stop.

33. (New) The optical imaging system of claim 28, wherein the aspheric optical surface is a refractive optical surface.

34. (New) The optical imaging system of claim 28, wherein the aspheric optical surface is a reflective optical surface.

35. (New) An exposure apparatus comprising:
a reticle;
an ultraviolet excimer laser configured to direct an ultraviolet flux to the reticle;
a substrate; and
the imaging system recited in claim 28, situated and configured to form an image of the reticle on the substrate.

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